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ABSTRACT

Though extensive research has been conducted to measure educational outcomes in terms of quantity and cost, there has been little discussion or analysis of educational quality and its measurement. Quality may be defined in terms of whether a service or product meets or exceeds prespecified standards and can be measured in relation to defined outcomes of a short-, medium-, or long-term nature. At Howard Community College (HCC), a model was developed to improve educational quality and provide criteria for measuring this improvement. The model involves a systems approach with six elements, i.e., analysis of course content in terms of goals, establishment of behavioral objectives, study of students taking courses and of course structures, development of an enriched learning approach for all students or an alternative learning strategy, implementation of learning strategies, and revision of strategies where appropriate. The success of this model is measured according to short-range goals (e.g., through studies of student success rates in courses and surveys of student and faculty attitudes) and intermediate-range goals (e.g., obtaining employment, successful transfer, goal achievement, and employer satisfaction). Long-range goals, including career success, quality of life, and position in the community, have not yet been measured. This model provides a first step in defining and measuring educational quality, which can serve as the basis for establishing accountability to constituencies. The paper includes findings from several HCC studies measuring educational quality. (HB)

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"Quality and Competence: Inseparable Imperatives"

by

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American Higher Education

3,000 institutions
500,000 instructional staff
800,000 other workers
11,300,000 students
$42 billion for operating purposes
$4 billion for capital improvements
$34 billion foregone income
$5 billion miscellaneous expenses
$85 billion total educational costs (5% of the GNP)

"When an industry reaches such financial magnitude, many people are bound to ask whether the outcomes are worth the cost." (Bowen, 1977)

Students, parents, legislators and citizens in general are asking this question, and as Bowen (1977) points out in Investment in Learning, this question is increasingly being asked in the context of disintegrating social values, changing morality, rampant ignorance, materialistic values, and an overwhelming array of other social problems. American society is demanding that American education be accountable. Even as the cry for educational accountablility goes forward, accountability as an educational concept remains disturbingly fuzzy. Anderson, Ball, and Murphy (1975) in the Encyclopedia of Educational Evaluation point to accountability as "the public's right to know what actions have been taken in the schools it supports and how effective these actions have been." They include in their definition the concept of redress of grievances and the imposition of penalities for failure and accomplishment. They suggest that the concept of accountability includes the redesign of the educational activity to achieve "educational effectiveness and efficiency and at what cost." (Anderson et al, 1975) Bowen (1977) points out that educators "cannot reasonably ignore the call for accountability." He says that the supporting society has to have the information necessary to make reliable judgments about the outcomes of higher education.

Bowen (1977) notes that efficiency in any enterprise has three elements to it:

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Quantity - how much of the product or service is produced.

Quality - how well is it produced

Cost - how many scarce resources were used to produce the product or service

To again quote Bowen, "the idea of efficiency for the American system of higher education is not so different from that for heating a house. In both cases, the problem is one of deciding to what extent and at what quality the benefit shall be achieved and how resources shall be deployed to obtain that benefit." (Bowen, 1977)

While we have argued that American higher education has a responsibility to operate efficiently and to report its costs and results to the society that supports it, this position demands a sensitivity to the difficulties faced by American higher education, not only in operating efficiency, but in simply determining how efficiently it is operating. Quantification is difficult. Higher education is only one of a myriad of influences that affect human beings. The results of higher education often occur many years after schooling has been completed. Our research data is sketchy and our analytical studies are of uneven quality. Finally, as Bowen (1977) points out, many of the effects are reported in averages which mask large individual differences.

Nevertheless, higher education has done a remarkable job in researching the issues of quantity and cost of an enterprise over the last decade as evidenced by the thorough and scholarly work carried out by the Carnegie Commission on Policy Studies and published under Clark Kerr's direction in the book entitled, Three Thousand Futures. (Carnegie Council, 1980) Three Thousand Futures analyzes the quantity of students in the past and the potential quantities of students over the next several decades in great detail. Similarly, it is replete with numerous tables and graphs analyzing the various aspects of the cost of higher education. Curiously, however, Three Thousand Futures is virtually devoid of references to educational quality or educational excellence. It is to the credit of the group that in chapter six, "Choices to be Made", the first choice listed is "quality." (Carnegie Council, 1980) "The quality of the academic product as measured by scores on tests taken before entering graduate work has deteriorated significantly....the deterioration largely takes place prior to entry into college since test scores out of high school have gone down similarly." Another oblique reference to educational quality is found in choice four, "adaptations compatible with the academic standards and community character of each college." Here, however, the Council on Policy Studies seems to actually be more concerned with quantity than quality since they are addressing adjustments which will have to be made as a result of the "demographic depression". (Carnegie Council, 1980) They discuss many adjustments that institutions will have to make to declining numbers and point out that "the dangers are threats to quality, to balance, to integrity and to the internal life of the campus..." (Carnegie Council, 1980) Examples of such changes in the academic standards in community character are admissions, recruitment, retention, programs and new schedules. Finally, they suggest that in the period between 1980 and the year 2000, institutions should replace

quantitative growth with qualitative growth indicating that thought and energy previously allocated to quantitative growth ought to be in the next two decades redirected toward qualitative development in teaching research and service.

With the exception of these two references and Supplement E, "Higher Education in Human Performance," (Carnegie Council, 1980) which to a great extent is really a discourse on educational quality, the Carnegie Council on Policy Studies, throughout 422 pages of scholarly discussion of the future of higher education, virturally ignores the discussion of educational quality and focusses almost solely on cost and productivity.

Numerous other examples can be pointed to to illustrate higher education's general neglect of the discussion of quality. We have, it seems, in education been focusing on what we could count, numbers of students and dollars. It is almost as though we have functioned at the level of first graders; that is, if we can't count it on our ten fingers and toes, it doesn't exist. Even in Anderson, Ball, and Murphy's (1975) scholarly Encyclopedia of Educational Evaluation, the only reference to quality is a discourse on statistical analysis and industrial quality control. Only Bowen seems to be writing about quality in American higher education.

What then is this thing called quality? First, we must separate in our thinking the concepts of outcome and value. An outcome is a result of what has been produced by an action in the environment. These outcomes may be positively or negatively valued. Society places values on all outcomes and rank orders them. For purposes of definition, quality as we shall define it here relates only to the production of an outcome against a prestated standard and does not relate to the value that society places on it. It is important that we separate results being produced against the standard from value. To illustrate, let's assume that we have a very talented artist who has developed a revolutionary art form with very clear and precise standards. Let us also assume that the artist is producing these new artworks to that standard, and that standard, no matter how excellent it might be, has not yet been accepted nor is it valued by the public. We now have an artist who is performing in a very high quality manner producing high quality artworks which are of no value. Conversely, many people lamented the development of pop art during the sixties. It was said to be of artistically low quality. It did not meet the high standards of the profession. Yet, it was highly valued by society. Thousands and thousands of dollars were spent to acquire it. Thus, we have two examples of situations in which social value and quality differ.

Quality, then, is defined by whether or not the service or product meets or exceeds the prespecified standards. Value relates to where society rank orders the service or product with regard to other services or products.

On the other hand, efficiency is the relationship between the quality and the cost to produce it. Thus, we might argue that Harvard is a high quality institution producing very valuable services for society but is inefficient because the cost to quality ratio is so high. Conversely, one

might argue that certain proprietary institutions are very efficient in that they produce an outcome to a prespecified standard at a very low cost but that that outcome is not valued by society. One might further argue that the success of community colleges in the last two decades is a result of not only of low cost which produced high quality outcomes, but also that these outcomes were valued by society.

Our definition of quality, then, relates to the production of goods and services equal to or in excess of the standards which were agreed to in advance. Thus, we have a concept that would allow us to say that a proprietary institution, a community college, or a selective university could produce high quality outcomes and thus their students could partake of high quality education.

What are these outcomes then in higher education that must be produced against a standard if we are to judge them as being high quality? Bowen says, "The chief product of higher education, learning in all its manifestations, consists primarily of changes in people, changes in their knowledge, their characteristics and their behavior," (Bowen, 1977) changes which we believe can be actually described as competencies. Bowen clearly charges us to begin the process in higher education of assessing the quality of the product we are delivering so that we can make a clear, meaningful and substantive case for educational efficiency in the coming decades. If quality then is defined in terms of the learner's competencies, it becomes clear that we have a major task to evaluate the accomplishments of these behavioral changes.

As we look at our definition of quality, clearly two parts of the definition jump out at us; first, the requirement for standards and secondly, results which have to be prespecified. A standard according to the dictionary definition is a "degree or level of requirement, excellence or attainment." Standards in education are often set in terms of test scores, observer ratings, performance profiles, or other quantitative measures of competence. Theoretically, we ought to be able to specify levels of quality by relating performance to various standards of proficiency. We must remember in the final analysis, all standards and individual attainments against them are a matter of judgment. Anderson, Ball, and Murphy (1975) point out, however, that these judgements can vary from "hard to soft".

In addition to standards in our definition, we must have prespecified goals and objectives which offer clear cut targets to be used by evaluators to judge whether or not the standards have been met. While numerous arguments have been made against the use of objectives and standards for the assessment of learning, Anderson, Ball, and Murphy (1975) identify five points of consensus generally shared among educators with regard to objectives.

1. Objectives expressed in measurable terms are appropriate for basic skills.

2. Behavioral objectives need not be reduced to trivial detail.

3. Behavioral objectives should relate to an instructional model that provides for individual differences. Currently, unmeasurable objectives should be included.

4. Educational objectives should be appropriate to the social value in which they are used.

5. Behaviors described in objectives ought to be generalizable to a variety of situations.

The objectives and standards that are used then clearly should be appropriate and valid. The objectives ought relate to the final knowledge, skills and abilities expected of the student outside the educational environment. In addition, the processes of evaluation of student behavior with regard to the accomplishment of objectives requires that certain criteria be satisfied also. The processes for measuring the attainment of these objectives must be objective, reliable, valid, practical and ethically responsible, if the evaluation processes are to be creditable and in turn if our judgments with regard to education's contribution are going to be sound. (Anderson et al, 1975)

Reinforcement for this position comes from a number of sources. Richard T. Ingram (1980) in his Handbook of College and University Trusteeship, suggests that trustee oversight requires continued monitoring of academic programs by being sensitive to academic warning signals. Some of these academic warning signals are declines in test scores, class ranks, or other positional measures of academic achievement, increases in attrition, decline in the success of graduating seniors. Thus, Ingram clearly is suggesting that trustees should be looking at institutional results to assess whether quality is being maintained.

Paul Dressel (1976) in his Handbook of Academic Evaluation notes that output evaluation assesses the attainment of those goals which are included in the program. Output evaluation includes among other things "the provision for quality control by recycling the program to attain unmet objectives." Dressel is clearly including the competency based definition of quality in his discussion.

Similarly, Jason Millman (1981) in his Handbook of Teacher Evaluation notes that "evaluation of the success of an enterprise is or ought to be based on how nearly the expressed goals and objectives of that enterprise are achieved." Again, Millman is including objectives and standards in his definition of quality.

Harold Hodgkinson (1975) in his article, "Evaluation to Improve Performance" in Dyckman Vermilye's Learner-Centered Reform points out that student learning outcomes in traditional and innovative programs allow us to evaluate comparatively innovative and traditional programs. Such evaluations are important because they can help administrators, faculty, students, funding agencies and the public find out if the innovations have been successful. Here again quality is a function of outcomes.

Some Indicators Of Quality: Table I shows a set of management indicators which were referred to earlier. It shows these indicators grouped under the three major headings of cost, volume and quality. As we noted earlier, much has been done with cost and volume, but, while there are many potential quality indicators, few have been researched thoroughly.

Table II shows the quality indicators grouped into three categories: input, process, and output indicators. Our argument here is that quality is defined by the outcome-oriented measures.

These outcome-oriented measures of quality are grouped into three categories and are shown in Table III. These three categories are short-range, intermediate-range and long-range. In the final analysis, it is long-range indicators that truly define quality: career success; position in the community; quality of life; satisfaction with self. These are the ultimate purposes of higher education.

It is necessary to have a group of intermediate-range goals which can be validated to relate to the long-range goals. Some of these intermediate-range goals would be completion of the program, employment, successful transfer, graduation, satisfying one's own specific educational goals.

Because of the time lags between our actions and our results in higher education as referred to earlier, it is necessary that we have short-range indicators of whether or not we are on a track toward quality.

Thus, we are arguing that if the unit and course objectives are accomplished to a large extent by most individuals and those objectives can be demonstrated to relate to intermediate-range goals and long-range ultimate outcomes, quality is being achieved. To put it another way, programs in which students accomplish objectives consistently over a period of time and in which these objectives are appropriate and valid is a higher quality program than one in which these conditions do not exist.

Howard Community College - An Evolving Model

Since opening in 1970, Howard Community College has been committed to improving the quality of student learning through a systematic instructional approach to course/program development and humanistic education. This commitment has been translated into a variety of activities designed to help students learn more through better course/program organization and behavioral objectives and to provide for more needs of our students (through self-pacing, mastery learning, and independent study) than occurs in traditional education.

In general, a systems approach is an organized approach to teaching which is designed to increase student learning and allows for accountability. Accountability occurs because objectives (sometimes called behavioral objectives) are explicitly defined and made public.

The systems approach at Howard Community College has six elements. The first element involves a careful analysis of what content should be included in the course (a "task analysis"). The goals of the course are stated and analyzed into sub-tasks. The second element involves developing and writing "behavioral objectives" based on the task analysis and creating test instruments to measure how well students have met the objective. The third element involves careful study of both the students taking the course and the structure of the course that is to be taught. This element, an "analysis of learning tasks" (ALT), is designed to provide a carefully organized course. The fourth element involves developing either an enriched main approach for all students or an alternative learning strategy to the main approach based on the ALT. This element is termed DIS or "development of instructional strategies." The fifth element, "implementation," involves trying out the strategies to see if they are successful and noting where improvements are needed. The sixth element, "revision," involves making changes and improvements.

For a few years there was a seventh step called "performance contracts." It was assumed that once a course had been developed through all six elements that the College could make a contract with a faculty member to produce a certain amount of learning. As a result of extensive discussion and investigation, a faculty committee recommended against such contracts, and this seventh element is no longer a part of the systems approach at Howard Community College.

Outcome Oriented Measures of Quality

Short Range

Success Rates:

An important measure of the impact of systematic instruction is student learning. One outcome measure of student learning is the percent who successfully complete a course. Student success rates are calculated on the basis of the number of students who complete the course with A, B or C grades. A percent is calculated by dividing the number of successes by the total number in the class as identified on the third week roster.

For fall 1981, the overall success rate at the college was 73 percent. The average success rate for the five previous fall semesters has been 69 percent. In attempting to examine the specifics of these success rates relative to the impact of systems development, we analyzed the data from several perspectives. This included an examination of the impact of systems development on large enrollment courses. An attempt was also made to examine the success history of all courses developed beyond the behavioral objectives stage including those courses offered during the most recent fall semester.

Large courses were defined as courses producing 300 or more student credit hours. Thirteen courses were identified, and the success rate for these courses was 67 percent for those sections taught by full-time faculty. When the developmental courses were excluded, the success rate was 72 percent, as compared to the 76 percent success rate for all courses

taught by full-time faculty.

Behavioral objectives have been approved for all of the 13 high enrollment courses. Five of the 13 courses are at the higher levels of systems development (four at the revision stage and one through the implementation stage). Four courses have received partial credits for alternative strategies, and four courses have been developed through behavioral objectives. When the three developmental courses are dropped, the success rates are 81 percent for the highly developed courses, 79 percent for the partially developed, and 71 percent for courses with only behavioral objectives. Since only ten courses were sampled, this trend must be viewed as only suggestive.

The next analysis involved examining success rates over the past five years for all courses (16) developed beyond behavioral objectives. Six of the 16 courses have gone through the revision stage, and one has gone through the implementation stage. The comparison period for these seven courses was based on the years prior to implementation. Success rates varied from 57 to 98 percent including developmental courses. Success rates were then looked at during the implementation phase. Of the four courses that showed improvement, the average increase in success rate was 5.5 percent. One course stayed the same. In the two courses that showed a decline, the average decrease was 4 percent. Most of these courses, however, as of the time of this study, had only applied the particular upper level of system development for one year or less.

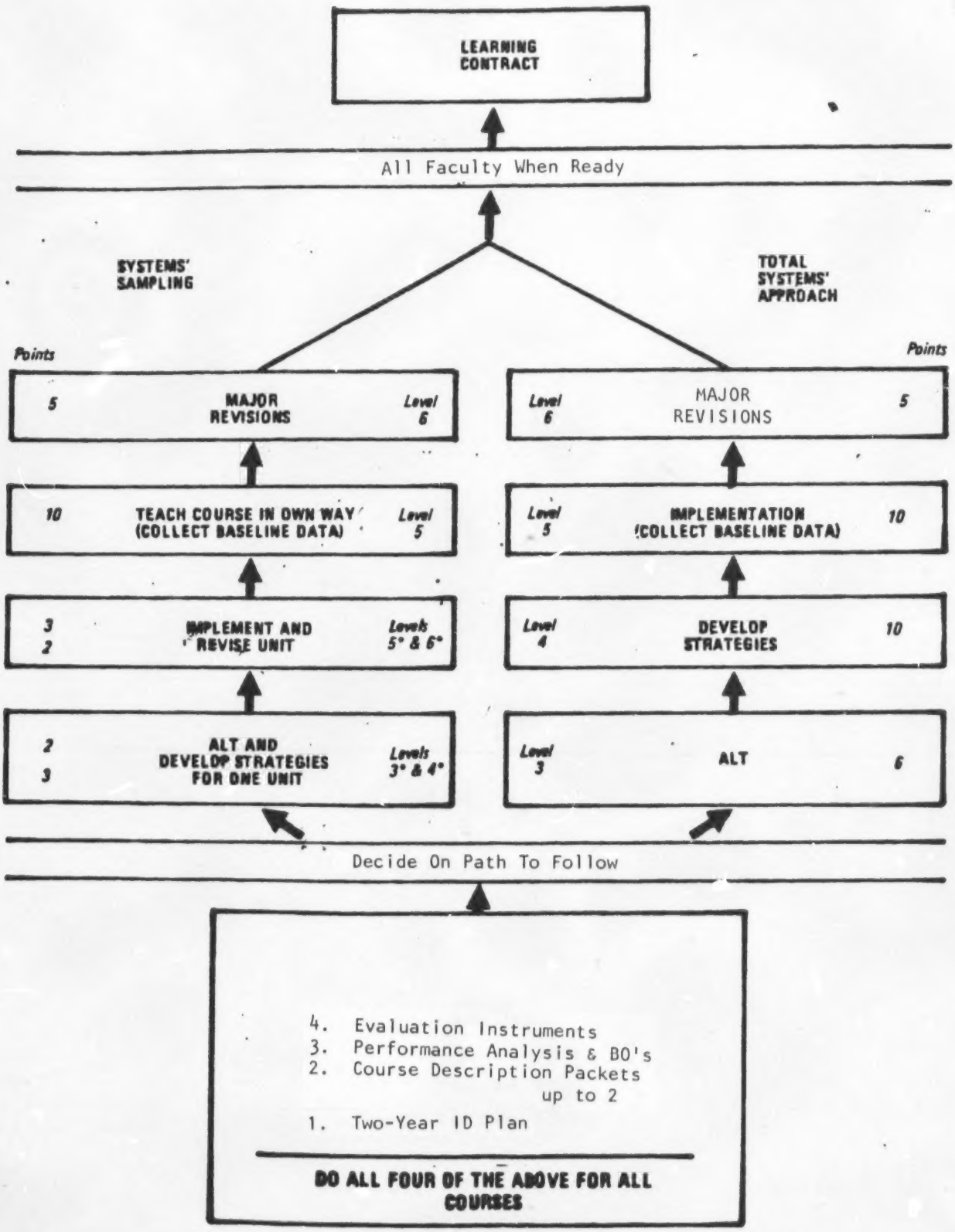
In examining the success rates for the most recent offering of the 16 highly systematized courses, an average success rate of 83 percent was determined. This success rate is ten percentage points higher than the college success rate of 73 percent. Eight of these 16 courses are among the largest in the college, generating more than 300 student credit hours, and two of the four developmental courses are also included. The five courses not yet developed to the implementation stage had an average success rate of 73 percent while the courses at the implementation stage had an average success rate of 85 percent. This analysis indicates that the highly systematized courses had a higher success rate during the most recent teaching of the course than the overall college success rate.

Faculty Attitude Survey:

Individual faculty comments provide an additional framework relative to the value and impact of systematic work. Information presented below was collected through Faculty Development Questionnaires, and through comments received by the Faculty Development Committee members. Comments received include: (1) My course is much more organized; (2) Students accomplish more objectives during the semester now; (3) I am able to more quickly pinpoint problem areas in the course; (4) I have more time now to spend with individual students; (5) I am doing more things in my course that students requested because I hear them more often now; (6) The course is easier in one sense because simple things lead to difficult things much more consistently than in the past; (7) My tests are tougher but students do better because I teach more in the course; and (8) I now have an independent option for students who have schedule conflicts, who miss

Figure 2

ALTERNATIVE SYSTEMS' PATHS


LEARNING CONTRACT
All Faculty When Ready
SYSTEMS' SAMPLING
TOTAL SYSTEMS' APPROACH
Points
5 MAJOR REVISIONS Level 6
Level 6 MAJOR REVISIONS 5
10 TEACH COURSE IN OWN WAY (COLLECT BASELINE DATA) Level 5
Level 5 IMPLEMENTATION (COLLECT BASELINE DATA) 10
3 2 IMPLEMENT AND REVISE UNIT Levels 5° & 6°
Level 4 DEVELOP STRATEGIES 10
2 3 ALT AND DEVELOP STRATEGIES FOR ONE UNIT Levels 3° & 4°
Level 3 ALT 6
Decide On Path To Follow
4. Evaluation Instruments
3. Performance Analysis & BO's
2. Course Description Packets
up to 2
1. Two-Year ID Plan
DO ALL FOUR OF THE ABOVE FOR ALL COURSES

class, or who work well independently. Data from the objective part of the questionnaires indicated that faculty understood the principles of systems and felt its greatest value has been in the task analysis and subsequent development of behavioral objectives. Faculty who perceived that their systems work had improved student learning were split on the effects of systems on improving student motivation and saw no increase in retention of students. Faculty also believed that increased student learning occurred for those students who remained in the course but that many more powerful factors may negatively affect success rates. Generally, few faculty at first saw the value of behavior objectives. As they developed competence in writing and using behavioral objectives, more positive attitudes developed. As more faculty move to the higher levels of systems, attitudes continued to change with increased competence and successes.

Student Attitude Survey:

The courses identified earlier as having been developed to level 4 or higher (development of learning strategies, implementation or revision) were the sample of highly developed courses used in this survey. The values of selected questions were compared to the college mean. Six of the 12 courses developed from systems model were evaluated by students: Chemistry 101; Geography 101; Math 110; Psychology 102; Science 101; and Sociology 101.

Six items dealing with personal relations with students were analyzed first (items). The average score for the six items for all courses was 1.2 and for the six highly developed courses it was 1.25, a very slight increase. It appears that the highly developed courses have not affected personal relationships with students. Item, "Seems to enjoy teaching this course," was rated at 1.5 both for all courses including the highly developed courses. The five items which one would expect to be rated more highly in systems courses are the following questions:

12. "Helps students see how present learning fits in with previous learning."
19. "Presents material in an organized fashion."
22. "Makes available adequate materials to supplement course."
24. "Presents specific course organization, objectives, and requirements to students."
32. "Provides alternatives to meet objectives."

The average institutional score for these five items was 1.06 for all courses and 1.25 for the highly developed courses. This difference suggests that, for these courses, students are aware of the systematic components identified by the student evaluation questionnaire and rate them highly. One final item was analyzed, question 4, "In general, taught course effectively." The mean for the College was 1.2 and the mean for the highly developed courses was 1.35. This higher rating suggests that students see these courses as being better taught, an important quality outcome of systematic instruction.

Another survey of student attitudes was administered to students who were enrolled in highly developed courses (courses having at least completed ALTs and developed strategies). A ten-item questionnaire was

given in nine classes near the end of the spring semester. One hundred eighty usable questionnaires were returned.

Each of the ten items described one component of systematic instruction and asked students to rate the value of that component on a one-to-four scale. Students rated all items as being useful. Course description (a two-page overview of a course) was most highly rated with a mean of 3.6, while independent study was the lowest rated at 3.0.

Figure 1
Student Ratings of Systematic Instruction

Elements of Systematic Instruction	Mean Rating*
Course description	3.6
Behavioral objectives	3.5
Practice tests and exercises	3.5
Study/film guides	3.4
Alternative Strategies	3.4
Self-pacing	3.2
Master learning/retesting	3.2
Challenge exams	3.2
Options to earn A	3.1
Independent study	3.0

*Mean was calculated by assigning the following numerical values to the rating categories:
1—no use 2--little use 3--useful 4--highly useful

For each question students were asked to indicate using a yes or no statement whether they thought other courses should have these systems components. Students strongly recommended that each component be developed in other courses. The lowest percent giving a positive response was 72 percent for independent study while all of the other percentages were in the low 80's and low 90's. A few students wrote comments on the surveys. The main points made were these: "Retesting helped learning to occur with less anxiety;" "The courses were organized;" and "Does learning with these help prepare one to learn at schools which don't have these helps?" The results found on the student evaluations are consistent with the positive responses found on this attitude survey.

Intermediate Range

The intermediate range deals with those elements of quality that address the direct outcomes of postsecondary education at the community college level, that is success in obtaining and performing on the job and/or successfully continuing training or education. Data to measure such outcomes generally are collected from one to several years after students have left the institution. Each year a graduate survey is conducted by the Maryland State Board for Community Colleges and the

college. The survey discussed below was administered in 1981 to Howard Community College graduates of the class of 1978.

Employment:

Nearly 80 percent of the 1978 graduates who responded reported immediate employment after graduation, with over three quarters of these working full-time (78.6 percent). Howard Community College graduates are successful in finding jobs related to the educational training they received while in college. Over half of Howard Community College's graduates working full-time reported employment directly related to the curriculum program in which they were enrolled. Howard Community College s graduates are satisfied with their job preparation. Ninety-five percent of the graduates working full-time indicated satisfaction with their job preparation received at the college. Twenty-seven percent said they were extremely satisfied. Most work in Maryland, with over 40 percent employed in Howard County. The mean annual salary of Howard Community College's graduates compares favorably with mean annual salaries statewide.

Transfer:

Sixty-six percent of the graduates of Howard Community College's transfer programs had gone on to further education within eight months of their graduation. Maryland state colleges and the University of Maryland are the most popular transfer institutions for Howard Community College's graduates. For Howard Community College's gradutes who did transfer, about half reported their transfer major to be directly related to their community college curriculum. Another 40 percent found curriculum is "somewhat related."

Howard Community College's graduates are, on the whole, satisfied or extremely satisfied with their preparation for transfer received at the college (over 93 percent). Over 40 percent are extremely satisfied. Howard Community College's graduates also do well in transfer institutions. Twenty-five percent of the college's graduates reported a cumulative G.P.A. of 3.5 or better at the transfer institutions and virtually 100 percent of the sample had a G.P.A. of 2.0 or better.

Goal Achievement:

In summary, both occupational and transfer program graduates reported a high level of goal achievement at Howard Community College and a high level of satisfaction with the preparation received. Graduates of Howard Community College's transfer programs, occupational programs, and general studies report over 90 percent goal achievement. The number of students who have transfer goals is lower at Howard Community College than state levels. On the other hand, the proportion who actually transfer is similar to statewide. Over 93 percent of the college's graduates were satisfied or extremely satisfied with classroom instruction. Ninety-five percent were satisfied or extremely satisfied with the college in general.

Employer Satisfaction:

In essence 86.7 percent of the employers found skills, as they applied

to their specific jobs, adequate (50.9 percent) or more than adequate (35.8 percent). In addition, 83 percent found technical knowledge good or very good. Relative to attitude, 94.3 percent found work attitude good or very good, and 92.5 percent found work quality good or very good. Finally, 96.2 percent indicated they would have another graduate in the same area.

Long Range

This final assessment element has not been measured by the college. As we continue to develop and examine our quality measures, this area will need to be addressed.

The information presented in this paper is only the first stage of an attempt to adequately face up to the challenge of accountability. We believe we have at least taken the first major step, that is to develop a definition of quality that is measurable and upon which we can begin to establish accountability with our constituents.

TABLE I

MANAGEMENT INDICATORS

COST

- Cost/Faculty
- Cost/Student Credit Hours
- Faculty/Student Ratio
- Class Size
- Expenditures/Budget

VOLUME

- Number of Faculty
- Number of Head Count
- Number of Student Credit Hours

QUALITY

- High School G.P.A.
- Admission Rejection Rate
- College G.P.A.
- CEEB Scores
- SAT Scores
- ACT Scores
- Graduation Record
- Failure Rule (Success)
- Attrition Rate
- Graduation Rate
- Student Evaluation
- Chairperson Evaluation
- Faculty Publication Rate/Reputation
- Transfer Success
- Job Success
- Class Size (FSR)

TABLE II

QUALITY

INPUT

- High School G.P.A.
- Admission Rejection Rate (Standards)
- CEEB Scores
- SAT Scores
- ACT Scores

PROCESS

- Student Evaluation
- Chairperson's Evaluation
- Faculty Publication (Reputation)
- Class Size (FSR)

OUTPUT

- College G.P.A.
- Graduate Record Exam
- Failure (Success) Rate
- Transfer Success
- Job Success (Promotion, Satisfaction or Salary)
- Student Performance
  (Were the objectives accomplished?)

TABLE III

OUTCOME ORIENTED MEASURES OF QUALITY

Short Range

- Accomplish Unit and Course Objectives*
- Percent of Objectives Accomplished by Individual
- Percent of Individuals Accomplishing 90% of Objective
- Percent of Individuals Not Accomplishing 90% of Objective
- Faculty and Student Attitudes

Intermediate Range

- Accomplish Program Goals
- Employment Rate
- Transfer Rate
- Graduate Rate
- Education Goals Satisfaction/Attrition

Long Range

- Career Success (Promotion, Money, Satisfaction)
- Position in Community
- Quality of Life
- Satisfaction with Self

*Course and Program Objective Must be Appropriate and Valid

TABLE IV

SECRETARIAL SCIENCE

This certificate of proficiency represents this person's attainment of the following levels of competency:

- is able to operate the electronic calculator, adding machine and transcribing equipment.
- has increased his/her effectiveness in business communication skills including the composition of business letters, interoffice memos and the principles of correct English usage.
- is able to type at a minimum of 40 words per minute (5 minute test - 3 error limit).
- understands basic accounting principles and can record, summarize and analyze bookkeeping transactions.
- can identify and describe current organizational and management principles as they are occurring in today's business world.
- is able to set up and control various types of records management systems.
- understands general office procedures such as reception, telephone and mail; can plan travel itineraries and meetings, etc.

TABLE V

HOME REMODELING

This certificate of proficiency represents this person's attainment of the following levels of competency:

- is able to remove and renew framing members in floors, walls, roofs, in a residential dwelling.
- can estimate materials and labor necessary to complete a home remodeling project.
- is able to install wiring within areas of existing service.
- is able to remove old plumbing fixtures and install new fixtures.
- is able to pour concrete footers, slab floors, sidewalks and make repairs to existing masonry surfaces.
- is able to remove old shingles and install new roofing material.
- can properly ventilate old structures, installing ventilation units and louver vents.
- is able to remove old kitchen cabinets and install new.
- is able to apply floor covering, and install hardwood flooring.

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